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**UNIVERSITY OF SWAZILAND**

**FINAL EXAMINATION PAPER**

**PROGRAMME: DIPLOMA IN AGRICULTURE YEAR 2 AND  
DIPLOMA IN AGRICULTURAL EDUCATION  
YEAR 3**

**COURSE CODE: CP 202**

**TITLE OF PAPER: SOIL FERTILITY**

**TIME ALLOWED: TWO (2) HOURS**

**INSTRUCTIONS: ANSWER ANY FOUR (4) QUESTIONS**

**DO NOT OPEN THIS PAPER UNTIL PERMISSION HAS BEEN  
GRANTED BY THE CHIEF INVIGILATOR**

**QUESTION 1**

- (a) Discuss the factors which influence the availability of phosphorus to plants in soils [20]
- (b) What strategies would you suggest to improve the availability of phosphorus to plants in such soils? [5]

**QUESTION 2**

- (a) Discuss the ways in which nitrogen may be added to soils [15]
- (b) Describe or give short descriptions of the following terms and indicate their significance in plant nutrition: (each question carries **2 marks**)
- (i) Nitrogen fixation
  - (ii) Xenobiotic compound
  - (iii) Luxury consumption
  - (iv) Phosphorus fixation
  - (v) Green manuring

**QUESTION 3**

Highlight the various ways that the fertility status of a soil may be evaluated [25]

**QUESTION 4**

A fertilizer recommendation for maize in the middleveld of Swaziland indicated the following:

N = 45 kg ha<sup>-1</sup>

P = 25 kg ha<sup>-1</sup>

K = 35 kg ha<sup>-1</sup>

- (i) Calculate the amount of the compound fertilizer 2:3:2 (38) that is required to supply all the nitrogen needed by the maize plants [10]
- (ii) How much P and K would the quantity of the compound fertilizer obtained in (i) above supply? [8]
- (iii) What are the disadvantages of using a compound fertilizer in supplying nutrients as shown above? [7]

**QUESTION 5**

- (a) What are the major soil fertility problems of soils of your named country? **[17]**
- (b) What practical strategies would you recommend to address these problems? **[8]**

**QUESTION 6**

- (a) Discuss the forms of potassium in soils and comment on their significance in the potassium nutrition of plants **[10]**
- (b) Discuss the ways in which potassium may be lost in soils **[15]**